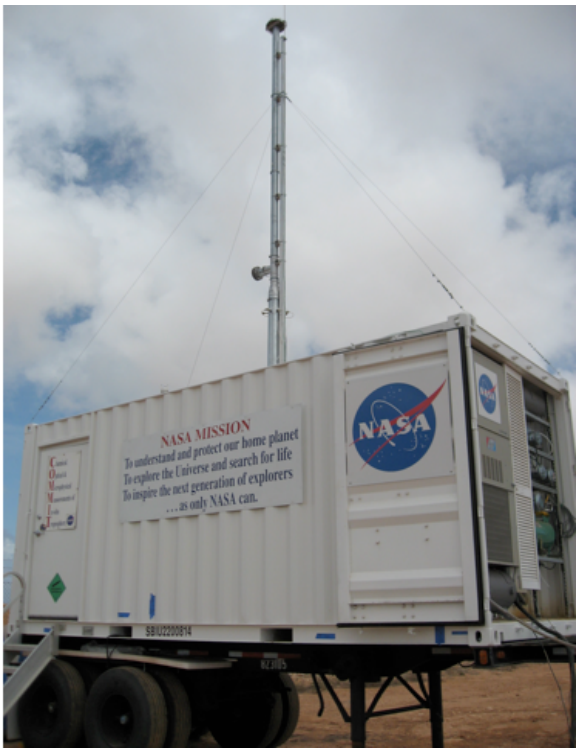
COMMIT

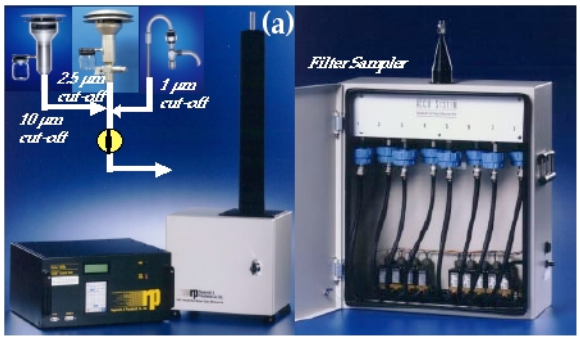
Chemical, Optical & Microphysical Measurements of In-situ Troposphere

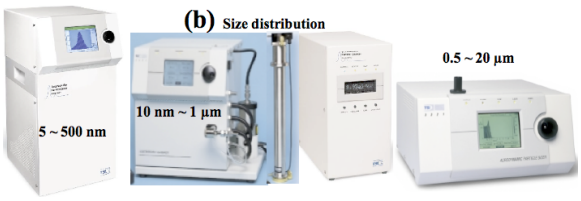


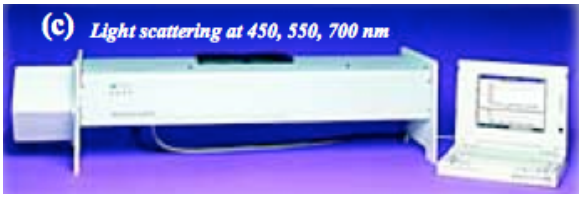
Key COMMIT Facts

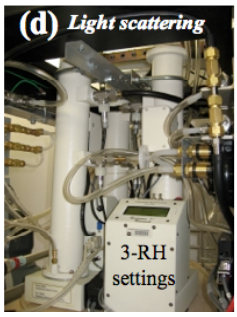
Heritage: Extending the success of the SMART mobile facility, COMMIT was built in 2006 as the companion in-situ observatory for studying some basic chemical, optical and microphysical properties of atmospheric aerosols and trace gases. Like SMART, all COMMIT instruments are integrated in a twenty-foot weather-sealed trailer with thermostatic temperature control. These two mobile laboratories can be deployed and operated together or individually. COMMIT has now been an integral part of multiple field campaigns, including the ongoing Asian Monsoon Years (2008-12), NAMMA (2006), and BASE-ASIA (2006).

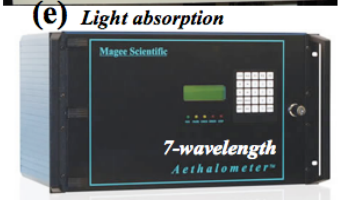
Normal Field Configuration*:* COMMIT is equipped with an inlet stack to ingest sample air from 10 meters above the ground and to split it into several groups of instruments: an ambient particle monitor for aerosol mass concentration and chemical composition (*cf.* Fig. a), three particle sizers for aerosol size distribution (*cf.* Fig. b), a three-wavelength nephelometer for particle scattering in the visible (*cf.* Fig. c), three single-wavelength nephelometers for particle light scattering at different relative humidities (*cf.* Fig. d), a three- and a seven-wavelength aethalometer for particle absorption in the visible (*cf.* Fig. e), and five trace gas analyzers for nitrogen monoxide/dioxide, sulfur dioxide, carbon monoxide/dioxide, and ozone concentrations (*cf.* Fig. f). In addition, the surface skin temperature and meteorological parameters near the surface and up to 2 km by tethered balloons (5 and 15 m^3) are measured (*cf.* Figs. g/h/i).

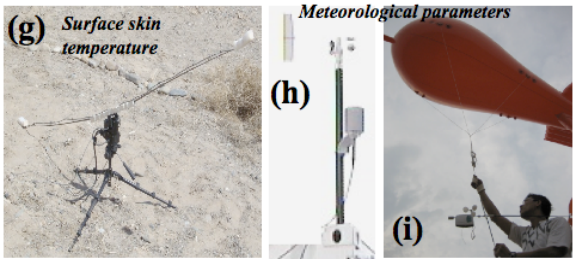












Science Questions for future Campaigns

- How are the chemical and microphysical properties of aerosol particles linked to their optical properties?
- How are the aerosol properties near the surface related to those in the boundary layer and aloft?
- Can we better quantify the aerosol indirect effect on the climate?

COMMIT URL

http://smart-commit.gsfc.nasa.gov/

COMMIT Data Products

- Aerosol particle mass concentration
- Aerosol chemical composition
- Aerosol particle size distribution
- Aerosol light scattering coefficient
- Aerosol light absorption coefficient
- Trace gas concentration
- Surface skin temperature
- Meteorological conditions, surface to 2km

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References

COMMIT Parameters

- Aerosol particle mass concentration with size cut at PM-10 (μm), PM-2.5, and PM-1
- Aerosol size distribution: 5 nm ~ 20 μm
- Aerosol light scattering coefficient at 450, 550, and 700 nm

- Aerosol light scattering coefficient at 530 nm, for dried, ambient, and humidified air samples
- Aerosol light absorption coefficient at (470, 522, 660 nm) and (370, 430, 470, 520, 565, 700, 950 nm)
- Gas concentration: NO/NO_x, SO_2, CO, CO_2, and O_3
- Meteorological parameters: P, T, RH, wind direction and speed (u, v), surface to 2km